

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for treating a heart in a human patient having a pericardial sac comprising:

- a. inserting a catheter into the pericardial sac of the patient;
- b. infusing fluid through the catheter into the pericardial sac and increasing a fluid pressure in the pericardial sac;
- c. constraining the heart with the infused fluid and the resulting increased fluid pressure, and
- d. reducing dilation of the heart by the constraint on the heart.

2. (Original) The method as in claim 1 further comprising monitoring pressure in the pericardium during infusion.

3. (Original) The method as in claim 1 further comprising adding or draining the fluid from pericardium to maintain a desired pericardial pressure value.

4. (Original) The method as in claim 1 further comprising inflating a balloon on a distal end of the catheter inside the pericardial space.

5. (Original) The method as in claim 1 wherein the patient has suffered an occlusion of a major coronary artery.

6. (Original) The method as in claim 1 wherein the infusion of fluid is continued for during a period of no greater than 14 days.

7. (Previously Presented) The method as in claim 1 wherein the infusion of fluid beings within twenty four hours after an infarction of the heart.

8. (Previously Presented) The method of claim 1 wherein the infusion of fluid is continued at least until reaching a predetermined pressure level.

9. (Previously Presented) The method as in claim 1 wherein during infusion a fluid pressure increases in the pericardium to a level of 5 to 10 mmHg.

10. (Previously Presented) The method as in claim 4 wherein the catheter is retained in the pericardial space by the balloon.

11. (Previously Presented) A method to constrain a heart of a mammalian patient, wherein the heart is in a pericardial sac, said method comprising:

- a. inserting a distal section of a catheter into the pericardial sac;
 - b. infusing a fluid from the distal section and into the pericardial sac;
 - c. increasing a fluid pressure in the pericardial sac by the infusion of the fluid,
- and
- d. reducing a dilation of the heart by the fluid pressure increase in the pericardial sac.

12. (Original) A method as in claim 11 further comprising reducing the fluid pressure in the sac after a treatment period of at least one day and less than fourteen days.

13. (Previously Presented) A method as in claim 11 further comprising monitoring a pressure of the infused fluid;

comparing the pressure of the infused fluid to a target pressure; and

draining at least some of the fluid from the sac if the pressure is above the target pressure.

14. (Original) A method as in claim 11 wherein the infused fluid is supplied from a container elevated above the patient at a height of between 68 centimeters (cm) and 272 cm.

15. (Currently Amended) A system for infusing fluid into a pericardial sac of a mammalian patient comprising:

a catheter having a distal section adapted to be inserted into the pericardial sac of the patient;

a supply of infusing fluid connectable to the catheter, wherein said fluid is infused into the pericardial sac through the catheter and exits the distal section[[, and]];

a pericardial pressure monitor connectable to said catheter and generating a signal indicative of a fluid pressure of at least one of the infusing fluid and a fluid pressure in the pericardial sac, and

a controller connectable to at least one of said catheter and the supply of infusing fluid, and said controller receiving the signal from the pericardial pressure monitor, wherein the controller regulates the fluid infused in the pericardial sac to provide sufficient pressure in the pericardial sac to constrain the heart and thereby reduce dilation of the heart.

16. (Currently Amended) A system as in claim 15 ~~further comprising a controller connectable to at least one of said catheter and supply of infusing fluid,~~ wherein said controller regulates an amount of fluid infused into the pericardial sac based on the signal indicative of fluid pressure in the sac.

17. (Previously Presented) A system as in claim 15 wherein the controller is a pump controller and further comprising a pump connectable to a supply line connected to a container of infusing fluid and to the catheter, wherein said controller adjusts a speed of the pump to regulate the fluid infused into the sac.

18. (Previously Presented) A system as in claim 15 wherein the controller further comprises a pressure target and said controller regulates the fluid infused into the sac based on a comparison of the pressure target and the signal indicative of the fluid pressure.

19. (Previously Presented) A system as in claim 17 wherein the pump is selected from a group consisting of a syringe pump, a peristaltic pump, and a gravity pump.

20. (Currently Amended) A method for treating the heart comprising:

infusing a flowable material into the pericardial sac of the heart, wherein the flowable material flows through a catheter inserted into the pericardial sac and the flowable material contacts the pericardial sac, [[and]]

continuing the infusing at least until the flowable material in the pericardial sac is a sufficient volume to increase a pressure in the sac and thereby constrain the heart and reduce diastolic dilation of the heart, and

reduce dilation of the heart by the constraint on the heart resulting from the infused flowable material.

21. (Previously Presented) A method as in claim 20 wherein the flowable material increases a pressure in the pericardial sac by at least 5 mmHg.

22. (Previously Presented) A method as in claim 20 wherein the flowable material increases a pressure in the pericardial sac by between 5 mmHg and 30 mmHg.

23. (Previously Presented) A method as in claim 20 wherein the flowable material is infused under a controlled pressure.

24. (Previously Presented) A method as in claim 20 wherein the flowable material is a fluid when infused into the sac.

25. (Previously Presented) A method as in claim 20 wherein the volume of flowable material forms a hydraulic shell in the sac and at least partially around the heart.

26. (Previously Presented) A method as in claim 24 wherein the hydraulic shell is a heart constrictor.

27. (Currently Amended) A method for treating a heart of a mammalian patient, the method comprising:

infusing a flowable material into a pericardial sac of the heart, wherein the flowable material is inside and in contact with the pericardial sac;

forming a hydraulic shell around at least a portion of the heart by the infusion of the flowable material into the pericardial sac, wherein the hydraulic shell increases a pressure in the pericardial sac due to the infusion of the flowable material, and

constraining the heart with the hydraulic shell and thereby reducing dilation of the heart.

28. (Previously Presented) A method as in claim 27 wherein the flowable material is a fluid during infusion.

29. (Previously Presented) A method as in claim 27 further comprising using a catheter having a tip extending through the pericardial sac and a lumen through which the flowable material passes to infuse the flowable material in the pericardial sac.

30. (Previously Presented) A method as in claim 29 further comprising sealing a puncture formed by the tip extending through the pericardial sac.

31. (Previously Presented) A method as in claim 29 further comprising extending the catheter tip from an interior of a blood vessel and through a wall of the vessel and the pericardial sac.

32. (Previously Presented) A method as in claim 31 wherein the catheter includes a seal and the method further comprises applying the seal against the wall to seal a puncture formed by extending the catheter tip through the wall.

33. (Previously Presented) A method as in claim 32 wherein the seal is an expandable balloon and the seal is applied by expanding the balloon to seal the puncture.

34. (Previously Presented) A method as in claim 29 wherein the catheter is placed in the pericardial space by performing a minimally invasive surgical procedure.

35. (Previously Presented) A method as in claim 29 wherein the catheter of a patient at a xiphoid area of the skin of the patient.

36. (Previously Presented) A method for treating a mammalian patient having a dilated heart enclosed inside a pericardial sac comprising:

- a. inserting a catheter into the pericardial sac of the patient;
- b. infusing fluid through the catheter into the pericardial sac, wherein an amount of fluid is infused to substantially increase a fluid pressure in the sac;
- c. constraining the heart with the infusion in the pericardial sac to substantially reduce the dilation of the heart, and
- d. sealing a puncture in the pericardial sac formed to infuse the fluid.

37. (Previously Presented) A method for treating a dilated heart in a pericardial sac of a mammalian patient, the method comprising:

- a. inserting a catheter in the pericardial sac;
- b. infusing fluid through the catheter into the pericardial sac, wherein an amount of fluid is infused to substantially increase a fluid pressure in the sac;
- c. constraining the heart with the infusion in the pericardial sac to substantially reduce the dilation of the heart, and
- d. sealing the pericardial sac.

38. (Previously Presented) A method for reducing expansion of an infarct of a heart in a human patient having a dilated heart enclosed inside a pericardial sac comprising:

- a. inserting a catheter into the pericardial sac of the patient;
- b. infusing the fluid through the catheter into the pericardial sac;

c. infusing sufficient fluid to cover substantially the entire surface of the heart with the fluid and to substantially increase a pressure in the pericardial sac, and

d. constraining the heart with the fluid substantially covering the heart to substantially reduce the dilation of the heart.

39. (Previously Presented) A method as in claim 38 wherein constraining the heart avoids a hazardous reduction of at least one of blood pressure and cardiac output.

40. (Currently Amended) A method for treating a patient with dilated heart comprising:

creating a cardiac tamponade of the heart by controlled infusion of a fluid into the pericardial sac to increase a fluid pressure in the pericardial sac, wherein the fluid is in contact with the pericardial sac;

constricting the heart by the infusion, and

dilating the heart by the constriction of the heart.

41. (Currently Amended) A method for treating a patient with dilated heart comprising:

creating a hydraulic shell around the heart by controlled infusion of a fluid into the pericardial sac, wherein the fluid is in contact with the pericardial sac and the hydraulic shell increases a fluid pressure in the pericardial sac;

constricting the heart by the infusion, and

dilating the heart by the constriction of the heart.

42. (Previously Presented) A method for treating a heart in a mammalian patient comprising:

extending a catheter through a blood vessel adjacent a pericardial sac of the heart;

puncturing a wall of the blood vessel and the pericardial sac with a distal section of the catheter;

infusing a flowable material from the distal end of the catheter to the pericardial sac of the heart;

forming a hydraulic shell around at least a portion of the heart by the infusion of the flowable material into the pericardial sac, wherein the hydraulic shell increases a fluid pressure in the pericardial sac, and

constraining the heart with the hydraulic shell.

43. (Previously Presented) A method as in claim 42 wherein the hydraulic shell forms a heart constrictor constraining the heart.

44. (Previously Presented) A method as in claim 42 wherein constraining the heart includes reducing a diastolic dilation of the heart.

45. (Previously Presented) A method for treating a mammalian patient having a dilated heart enclosed inside a pericardial sac comprising:

inserting a catheter into the pericardial sac of the patient;

infusing fluid through the catheter into the pericardial sac to increase a fluid pressure in the pericardial sac, and

constraining the heart with the increased fluid pressure in the pericardial sac to substantially reduce the dilation of the heart.

46. (Previously Presented) A method for reducing abnormal dilation of a heart to treat at least one of acute myocardial infarction and heart failure conditions, the method comprising:

positioning a fluid infusion device such that at least one opening at a distal end is inside the pericardial sac and a proximal end of the device is outside of the patient,

pumping fluid through the device to infuse the fluid into the pericardial sac to increase a pressure in the pericardial sac,

constraining the heart with the infusion and,

sealing the pressurized fluid within the pericardial sac,

47. (Previously Presented) A method as in claim 46, further comprising:

regulating the constraint of the heart to achieve substantial reduction of dilation of the heart.